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## **Command Lab Designs Component for New Aegis Ships**

NSWC PHD houses the Engineering Development Laboratory (EDL), a state-of-the-art facility that provides in-house design, prototyping and testing capabilities for components of the surface fleet's combat systems. The lab is currently working in joint cooperation with other naval activities and contractors on the Current Limiting Device (CLD) project, which consists of the design and development of an electronic component to be used within the Aegis Combat System. This is a joint program effort involving Bath Iron Works, Supervisor of Shipbuilding Bath, Program Executive Officer for Ships (PMS 400D), Lockheed Martin and BF Systems.

"The CLD is an active circuit protection device for the Aegis Combat System," said Thomas Smith, Combat System Support Equipment Engineering Branch manager. "The device is used in conjunction with shipboard 60/400Hz frequency conversion and distribution systems."

The CLD automatically inserts a series impedance between the 400Hz converter and the load to limit the magnitude of current transients to a level that can be handled by the 400 Hz frequency converter during the time required for downstream circuit breakers to clear. Its function is to prevent fault currents from causing the 400 Hz frequency converters to self-protect (shut down), thereby causing a temporary loss of 400 Hz power to the ship.

The CLD is an improvement over the Fault Isolation Unit currently in use. Improvements include: user programmable settings (such as trip level, reset level and current limit duration); alpha-numeric display; current interrupt capability; improved self-protection; modular design; and ease of maintenance.

The CLD is slated to be installed on the Aegis destroyers DDG 103 and follow. The DDG 103 and 104 are in shipbuilding production and should be fitted with CLDs in late fiscal year '06. Backfit is also being proposed for Aegis cruisers.

The CLD project is only one of many research, design and development ventures taking place at the EDL. Since the lab is equipped with the latest hardware and software technology, it boasts a variety of capabilities such as computer solid modeling, rapid prototyping, fluid dynamics simulation, mechanical drafting, reverse engineering, component failure analysis, dynamic assembly motion analysis, and prototype fabrication.

"Our lab provides a full-service facility to assist engineers and technicians at NSWC Port Hueneme with problem analysis as well as the design, development and testing of solutions prior to committing to fabrication," said Keith Sander, EDL team lead. "We often use the 'virtual prototyping' method, which helps to avoid potential design errors and future fabrication difficulties, and at the same time yields cost savings."